



Cooperative Extension
Urban Integrated Pest Management



IPM in Public Schools

Carl Olson

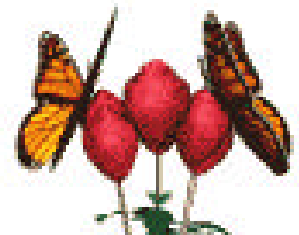
University of Arizona

Department of Entomology



The Good That Insects Do

- 8 Pollinators
- 8 Commercial Products
- 8 Decomposers
- 8 Biological Control
- 8 Good source of protein



What is IPM?



- G Integrated Pest Management (IPM) is a pest management strategy that provides long-term management of pest problems with minimum impact on human health, the environment and non-target organisms.**
- G IPM programs are educationally based and focus on our knowledge of pest biology and its relationships within the environment.**

What is IPM?

- ⌘ IPM is sustainable
- ⌘ IPM focuses on reducing pest conducive conditions and ecologically sound remedial action
- ⌘ IPM is 90% people management and 10% pest management



Management Techniques Used as Part of an IPM Program Include:

- 1 Improving hygiene standards
- 1 Use of pest exclusion methods
- 1 Habitat manipulation
- 1 Encourage naturally occurring biological control species
- 1 Selection of target specific control products that have low mammalian toxicity and low environmental impact
- 1 Biological control products are often used very successfully



Pests

- D** Less than 5% of all bugs are ever considered pests. Many organisms are essential in one environment but can become a pest in another environment.
- D** Pests of medical significance should always be dealt with immediately.

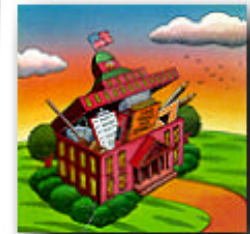


IPM Steps:



- 7 Pest identification and establishing useful biological information about the organism.
- 7 Monitoring and use of threshold levels. Many organisms do not achieve pest status unless large numbers are apparent.
- 7 If necessary, take action. If the organism is found to have a pest status, then ecologically sound management methods are employed to reduce the pest populations to acceptable levels.

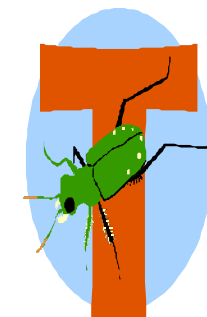
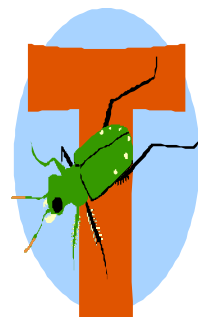
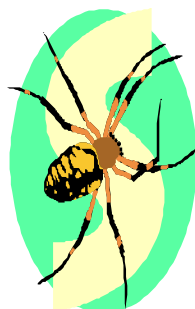
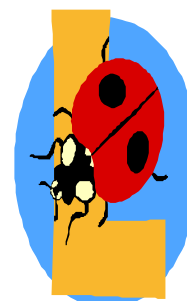
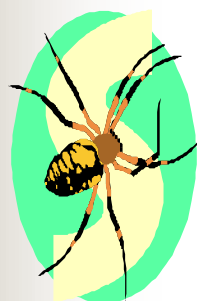
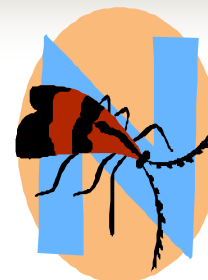
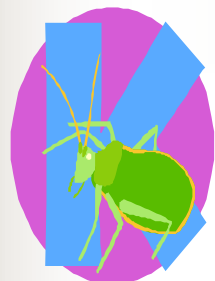
Key Features of the *IAQ Tools for Schools Kit*



<http://www.epa.gov/iaq/schools/tools4s2.html>



- **Low Cost**
- **Adaptable to Individual School/School District Needs**
- **No Specialized Training Required**
- **Voluntary**
- **Common Sense Approach**



DO PESTICIDES BUG YOU?



Integrated Pest Management in the Kyrene School District



B >90% reduction in
chemical pesticide use

B >85% reduction in bug
pests





Kyrene School District No.28

Chandler/Gila River/Guadalupe/Phoenix/Tempe, Arizona






**Kyrene Schools
Community Foundation**

- 8 Stan Peterson – Head of Facilities**
- 8 Roy Morris – Grounds Supervisor and IPM Specialist**
- 8 IPM in Schools Program Leader – Dr. Marc Lame (University of Indiana)**
- 8 University of Arizona Entomologists – Dawn Gouge, Kirk Smith, Carl Olson, Paul Baker, & Mike Lindsey**
- 8 Arizona Structural Pest Control Commission – Carl Martin**
- 8 School faculty, staff and students.**

Problem Pests in School



School	Primary Pests	Solutions
Paloma (Go Doves)	Roaches, ants, house crickets 	Hygiene, exclusion, IGR baits (roaches)
Cielo (Go Firebirds)	Scorpions, roaches, house crickets 	Habitat modification, exclusion, IGR baits (roaches)
Pueblo (Go Bulldogs)	Moth flies, house crickets, ants, mosquitoes 	Hygiene, exclusion, habitat modification

What are the main Factors Causing Pest Problems in Schools ?

Poor pest proofing

The practice of allowing
food and drinks outside
of the normal eating areas



Concrete Cold seams



Custodial Closets



Teacher storage



Health Office





Kitchen



Kitchen Equipment



Escutcheon plates and seals

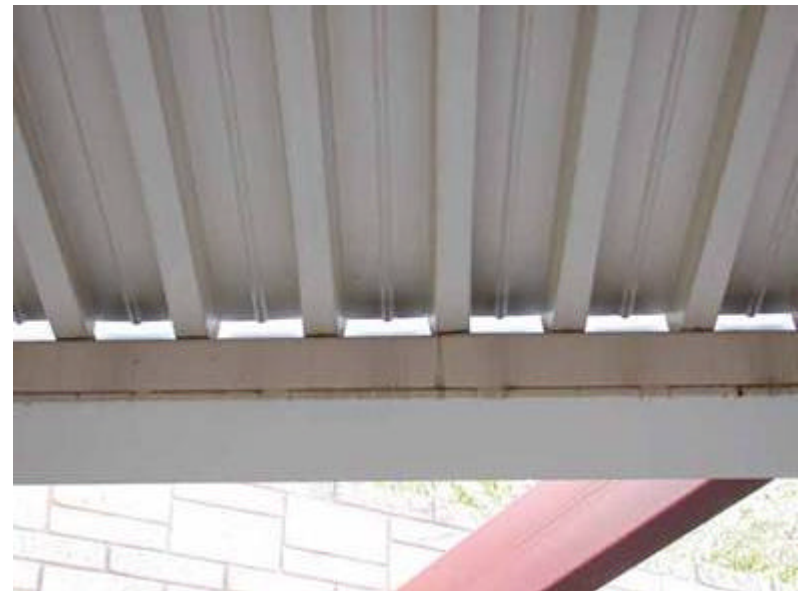


Kitchen Problems





Bird Nest Sites



Entry Point



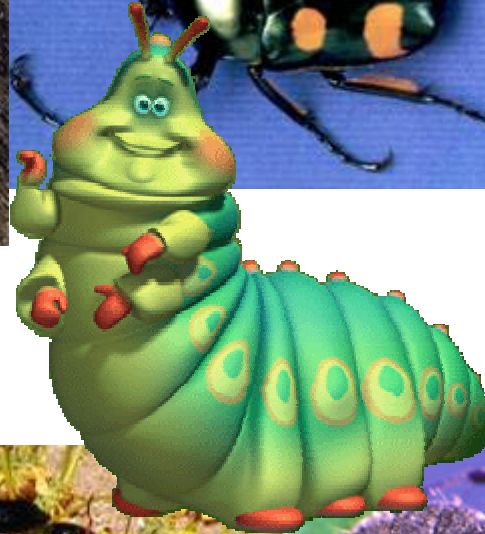
Access panels



Water sources



Insects



Scorpions



**1 Can fluoresce
under ultraviolet light**



- Liquid food intake
- Webs are used to capture prey and many other purposes
- All are beneficial, few are hazardous

Spiders

Recluse spider



Widow spider



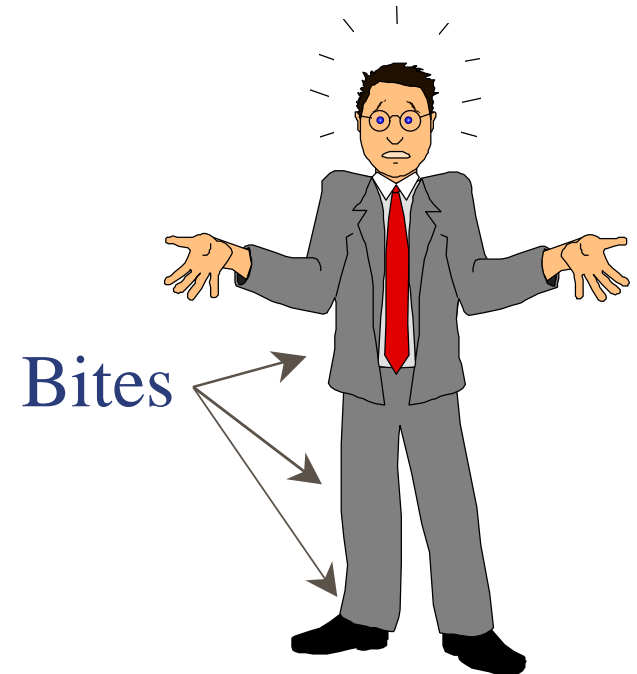
Tarantula



Chiggers



- 8 Mites feed on the surface of human skin. Affected skin will redden and swell due to feeding enzymes.
- 8 Common in mid-summer, in grassland, and weedy areas.
- 8 Repellents help. Bath in hot, soapy water to remove remaining chiggers and relieve bites.



Crickets

Simply exclude them
from your buildin

Totally harmless



Cockroaches

- N Over 4,000 species
- N Active at night
- N Smell bad



German cockroach



American cockroach

Termites

A Small, soft body, yellow or whitish, reproductives are darker

A Wide waist, bead-like antennae

A Live in colonies in wood or soil, three castes: workers, soldiers, and swarmers



Termites

- ✓ Drywood (non-subterranean) termites as well as subterranean termites occur in Arizona
- ✓ Drywood termites infest dry wood and do not require contact with the soil





Subterranean termites
are the most destructive insect pests of wood in the United States. They cause more than \$2 billion in damage each year, more property damage than that caused by fire and wind storms combined.

House Flies

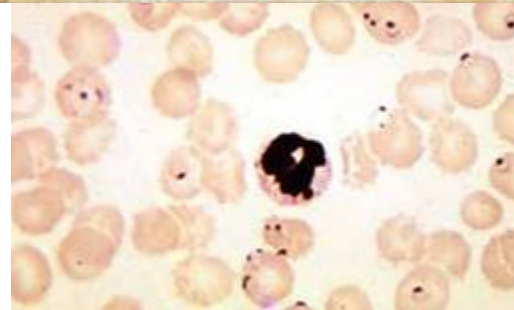
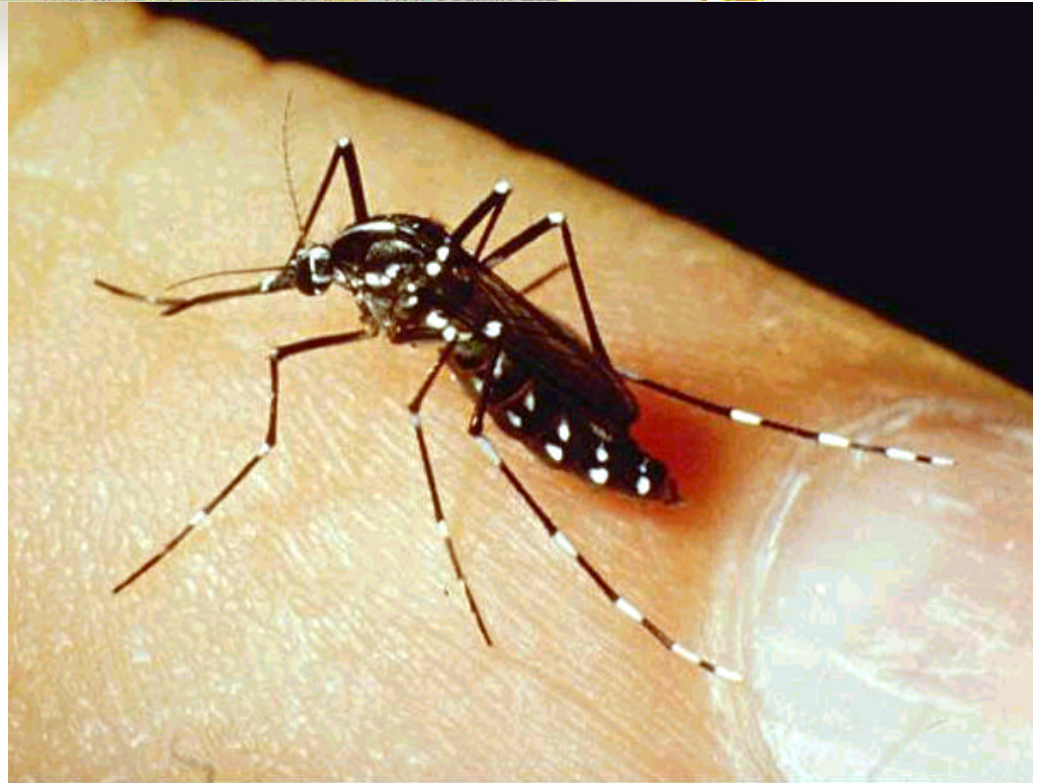


- 9 Maggots can develop in rotting garbage in and around the home and school
- 9 Adults can transmit disease organisms

Mosquitoes

They are a major health hazard in many parts of the World and are responsible for the transmission of yellow fever, malaria, dengue fever, encephalitis, and many other serious diseases.

Dog heartworm



Malaria parasites



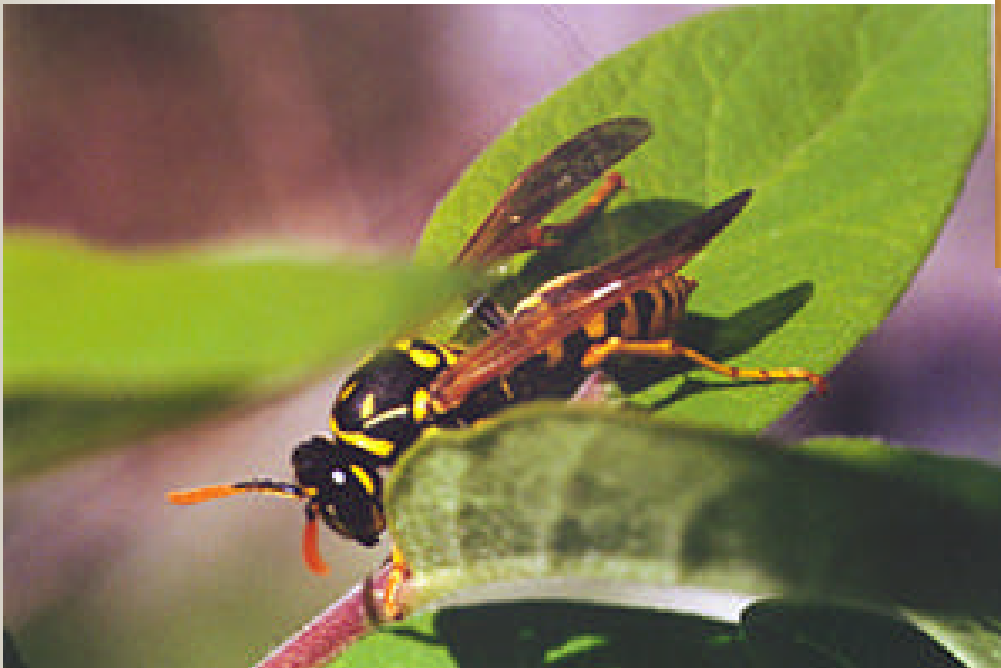
Flooded School Play Field



W Social insects

W Venomous
sting are painful
and can initiate an
allergic response

Paper Wasps



Paper Wasp Nest



Honey Bees

6 Honey bees provide more than 80% of the pollination required by agricultural crops.

6 Introduction of Africanized bees.





- ⌘ Bees are beneficial
- ⌘ You can not tell Africanized bees from European bees by looking
- ⌘ Stings are no more potent but a greater proportion of Africanized bees will defend the hive





Ants in Your Pants?

A Acrobat

A Argentine

A Bigheaded

A Carpenter

A Crazy

A Field

A Southern fire

A Red imported fire

A Ghost

A Harvester

A Little black

A Little fire

A Odorous house

A Pavement

A Pharaoh

A Pyramid

A Small/False honey

A Thief

A Yellow

A Velvety tree

A Leafcutter

Stored Product and Fabric Pests



Feral Cats and Dogs



Cats and Dogs need to be loved and cared for at home

6 Rabies

6 Plague



Cats and Dogs need to be loved and cared for at home

- H ROUNDWORMS
- H HOOKWORMS
- H TAPEWORMS
- H GIARDIA
- H TOXOPLASMA
- H CRYPTOSPORIDIA
- H VARIOUS ENTERIC BACTERIA
- H FLEAS

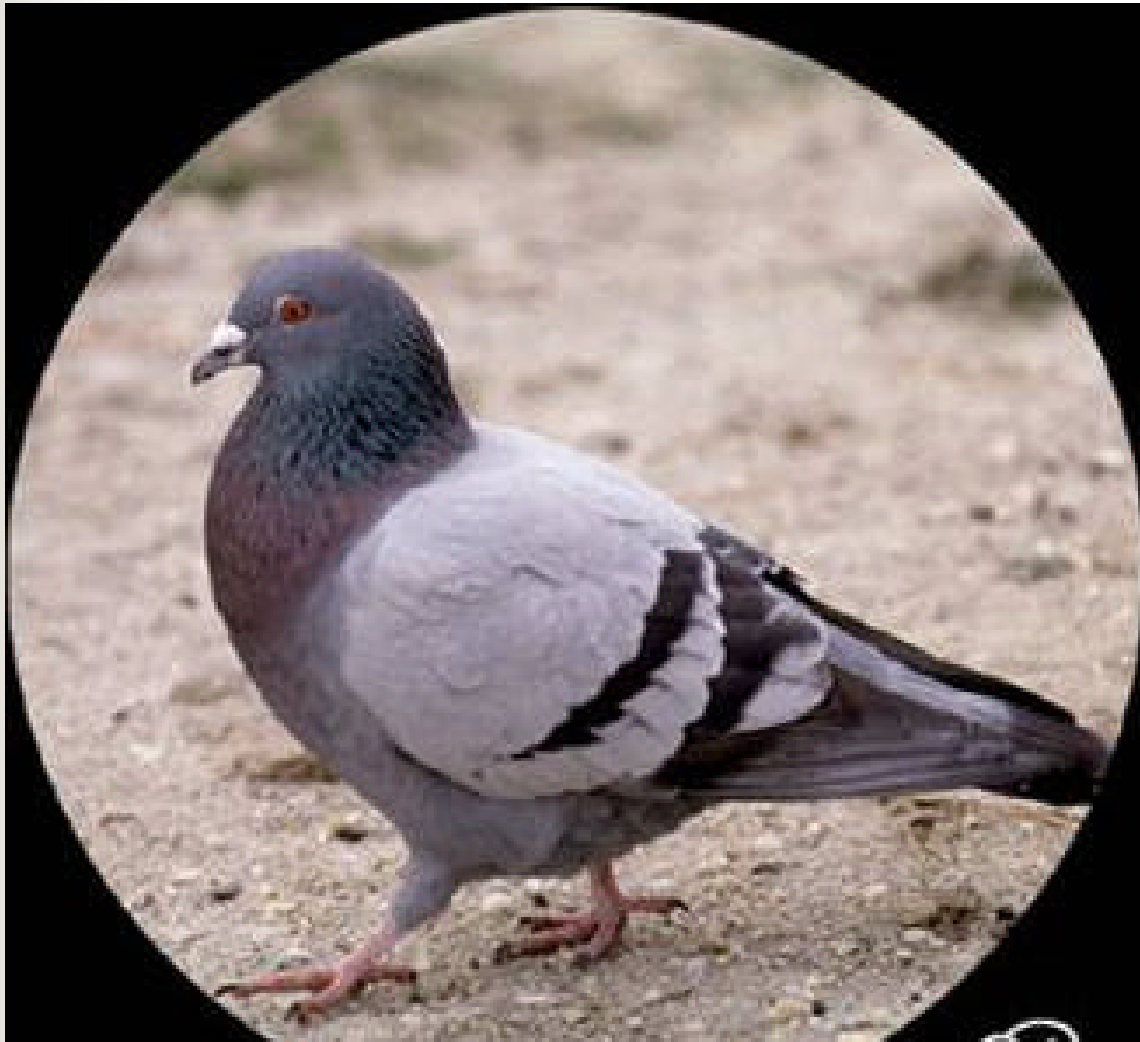




Rodents



Birds



Psittacosis

What Are Pesticides?

⌞ *Any substance or mixture of substances used for controlling, preventing, destroying, repelling, or mitigating pests*

- S Insecticides, herbicides,
- S fungicides, rodenticides
- S Bactericides
- S Repellents, attractants





Possible Chronic Effects:

RCarcinogenicity-cancer

RMutagenicity-genetic mutation

RTeratogenicity-birth defect

ROncogenicity-tumors

RReproductive effects

RDelayed neurological effects

Pesticide Safety

Characteristics of New Insecticides

- Ⓒ Usually specific target site
- Ⓒ Limited pest range
- Ⓒ Safe to mammals
- Ⓒ Limited persistence
- Ⓒ Safer than pyrethroids to natural enemies
- Ⓒ Low use rates





What's Bugging You in Arizona?

[Bugs](#)

[Vertebrates](#)

[Plant
Diseases](#)

[Weeds](#)

[Beneficials](#)

[What Is IPM?](#)

[Health Concerns](#)

[Venomous Animals](#)

[First Aid](#)

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This image of a house in an arid landscape provides an alternate avenue of access to the same pages as the links on the left. Click on the house for things [inside the home](#), on the yard for things [outside the house](#).

[**http://ag.arizona.edu/urbanipm/**](http://ag.arizona.edu/urbanipm/)

[Fact Sheets/Toolkits](#) | [Classes/Workshops](#) | [Grants Awarded](#) | [Partnerships](#) | [Regional Information](#) | [More Information](#)

One of EPA's highest priorities is protecting children's health from unnecessary exposure to pesticides that are used in their schools to control pests. EPA is encouraging school officials to adopt Integrated Pest Management (IPM) practices to reduce children's exposure to pesticides.

IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

EPA is helping schools understand and implement IPM through the distribution of printed publications, awarding grants to start IPM programs, offering workshops and courses and providing guidance and assistance through partnerships with universities and national associations.



<http://www.epa.gov/pesticides/ipm/>



School IPM

Integrated Pest Management in Schools

Main Menu

What is IPM?

Parents

Administration

Faculty/Staff

Pest Manager

Administrator Info

Forms, etc.

Sample Letters

Contract

Regulatory

Poison Centers

Presentations

News Releases

IPM Design

Pests

Pesticides

Technical Info

IPM Design

Pests

Pesticides

Non-Pesticides

Teaching IPM

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By Location

By Subject

- [Latest Additions](#) - [SEPA Bill](#) - [Senate School IPM Bill](#)
- [What is School IPM?](#)
- [Information for the Administrator](#)
- [Educational Presentations for School IPM](#)
- [Technical Information on School IPM](#)
- [Teaching Curriculum](#)
- [Related WWW Sites](#) - [By Location](#)- [By Subject](#)
- [School IPM Listserv](#)
- [School IPM CD-ROM](#)



<http://schoolipm.ifas.ufl.edu/>



IPM Standards for Schools: **A program for reducing pest and pesticide risks in schools and other sensitive environments**

IPM Standards for Schools Access Options

Best viewed in PDF format with free Acrobat Reader V 4.0 or later.

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[Part I. IPM Standards for School Buildings - HTML Format](#)

[Part II. IPM Standards for School Grounds - HTML Format](#)

[Links and Resources - HTML Format](#)

Introduction & Appendices - Contents

Introduction

[Why IPM in schools?](#)

[IPM Standards](#)

[IPM Certification](#)

[Becoming an IPM Certified School](#)

[IPM for Other Sensitive Environments](#)

[Resources for Starting Your IPM Program](#)

[Completing the IPM Standards](#)

[Calculating your IPM score](#)

Appendix A: Pest Control Options

[Appendix B: Glossary](#)

**[Appendix C: Links & Resources for School
IPM](#)**

[The IPM Continuum](#)

[Acknowledgements](#)

[About Version 2.0](#)

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[Apply to become an IPM Certified School](#)

http://www.ipminstitute.org/school_standards.htm



Useful Websites:

http://www.ipminstitute.org/school_standards.htm

<http://ag.arizona.edu/urbanipm/>

<http://www.ianr.unl.edu/pubs/pesticides/ec2505.htm>

<http://schoolipm.ifas.ufl.edu>